WE CLAIM:

1. A structure comprising:

a substrate;

a plurality of liquid-crystal cells overlying the substrate above where the substrate is substantially transmissive of specified light;

a like plurality of transistors respectively corresponding to the liquid-crystal cells, each transistor being in electrical communication with the corresponding liquid-crystal cell;

an electron-beam system for bombarding each transistor with electrons that cause it to be selectively in (i) a non-conductive condition in which its channel-region electric field is substantially insufficient for conduction or (ii) a conductive condition in which its channel-region electric field is sufficient for at least partial conduction; and

a control component which, during selected time periods when a transistor is in its conductive condition, provides that transistor with a control signal that results in the specified light having its polarization direction selectively rotated in the corresponding liquid-crystal cell.

2. A structure as in Claim 1 wherein, during disablement periods, the control component causes all the transistors to be disabled regardless of whether each transistor is in its conductive or non-conductive condition.

3. A structure as in Claim 1 wherein each liquid-crystal cell operates from (i) a low-rotation condition in which the polarization direction of the specified light in that cell rotates a first amount as little as zero to (ii) a high-rotation condition in which the polarization direction of the specified light in that cell rotates a second amount greater than the first amount.

4. A structure as in Claim 3 wherein the transistors are electrically coupled together for receiving their control signals as substantially a common control signal from the control component.

5. A structure as in Claim 4 wherein the common control signal is largely at (a) one of at least one low-impedance erase value that results in all the liquid-crystal cells being in their low-rotation conditions, (b) one of at least one low-impedance writing value that results in the polarization direction of the specified light being selectively rotated in each liquid-crystal cell for which the corresponding transistor is in its conductive condition, or (c) one of at least one high-impedance value that causes all the transistors to be disabled regardless of whether each transistor is in its conductive or non-conductive condition.

6. A structure as in Claim 5 wherein one erase value of the common control signal lies approximately midway between two writing values of the common control signal, the control component alternating between the two writing values in generating the common control signal.

7. A structure as in Claim 1 wherein the electron-beam system generates a scanning electron beam for selectively bombarding each transistor with electrons at a dosage and average energy which cause that transistor to be in its conductive condition.

8. A structure as in Claim 7 wherein electrons provided by the scanning electron beam selectively cause each bombarded transistor to become electrically charged to at least a threshold level and thereby placed in that transistor's conductive condition.

9. A structure as in Claim 8 wherein each transistor is in its conductive condition when it is positively charged.

10. A structure as in Claim 7 wherein electrons of the scanning electron beam bombard selected ones of the transistors in accordance with an image pattern while all of the transistors are disabled.

11. A structure as in Claim 10 wherein the electron-beam system modulates the current of the scanning electron beam in accordance with image gray levels for causing the conductive condition of each transistor to vary between a low-field condition and a high-field condition such that the

polarization direction of the specified light in the corresponding liquid-crystal cell is rotated in a corresponding manner.

12. A structure as in Claim 7 wherein the electron-beam system generates an additional electron beam for largely simultaneously bombarding all the transistors during selected bombardment time periods with electrons at a dose and average energy which cause all the transistors to be in their conductive conditions.

13. A structure as in Claim 12 wherein electrons of the additional electron beam simultaneously bombard all of the transistors during other bombardment time periods with electrons at a dosage and average energy which cause all of the transistors to be in their non-conductive conditions.

14. A structure as in Claim 13 wherein the average electron energy is greater during bombardment of the transistors for causing them to be in their conductive conditions than for causing them to be in their non-conductive conditions.

15. A structure as in Claim 7 wherein the electron-beam system generates an additional electron beam for largely simultaneously bombarding selected ones of the transistors during selected bombardment time periods with electrons at a dose and average energy which cause each selected transistor to be in its non-conductive condition.

16. A structure as in Claim 1 further including a flexible membrane situated between each transistor and the corresponding liquid-crystal cell.

17. A structure as in Claim 17 wherein the membrane includes spacing elements situated between the liquid-crystal cells.

18. A structure as in Claim 16 wherein the transistors electrically communicate with the liquid-crystal cells through openings in the membrane.

19. A structure as in Claim 1 wherein each transistor comprises:

first and second laterally separated source/drain regions, the first source/drain region being in electrical communication with the liquid-crystal cell corresponding to that transistor;

a semiconductor layer having semiconductor material that extends between the source/drain regions; and

a gate element situated above at least the semiconductor material between the source/drain regions for controlling the conductive and non-conductive conditions of that transistor.

20. A structure as in Claim 19 wherein, upon being bombarded by electrons at a dosage and average energy suitable for causing the transistors to be in their conductive conditions, the gate element of each transistor is sufficiently electrically charged in a selected charging direction to induce the channel-region electric field for that transistor's conductive condition.

21. A structure as in Claim 20 wherein, upon being bombarded by electrons at a dosage and average energy suitable for causing the transistors to be in their non-conductive conditions, the gate element of each transistor electrically charges sufficiently in a further charging direction opposite to the selected charging direction to induce the channel-region electric field for that transistor's non-conductive condition.

22. A structure as in Claim 19 wherein the gate element of each transistor has an exposed surface which is bombarded by electrons from the electron-beam system and which has a secondary emission coefficient (a) less than 1 when electrons bombard that surface at an average energy below a crossover value and (b) greater than 1 when electrons bombard that surface at an average energy above the crossover value in a range extending to a higher energy value.

23. A structure as in Claim 19 wherein the gate element of each transistor comprises:

a first gate dielectric layer situated over at least the semiconductor material between the source/drain regions; and

a second gate dielectric layer overlying the first gate dielectric layer, the second gate dielectric layer being capable of storing electrical charge and of having its electrical charge change upon being bombarded by electrons from the electron-beam system so as to selectively induce the channel-region electric field for the non-conductive or conductive condition of that transistor depending on the electron dose and average energy.

24. A structure as in Claim 23 wherein the second gate dielectric layer of each transistor has a secondary electron emission coefficient (a) less than 1 when electrons bombard the second gate dielectric layer at an average energy below a crossover value and (b) greater than 1 when electrons bombard the second gate dielectric layer at an average energy above the crossover value in a range extending to a higher energy value.

25. A structure as in Claim 19 further including a like plurality of display electrodes respectively corresponding to the liquid-crystal cells and thereby respectively corresponding to the transistors, each display electrode electrically coupled to the first source/drain region of the corresponding transistor and electrically contacting the corresponding liquid-crystal cell along largely all of its upper surface.

26. A structure as in Claim 25 wherein each display electrode is light reflective along where it contacts the upper surface of the corresponding liquid-crystal cell.

27. A structure as in Claim 1 wherein:

the structure is allocated into an array of pixels, each comprising multiple subpixels, the subpixels having an average subpixel width in a first lateral direction;

the electron-beam system generates an electron beam for scanning the subpixels, the electron beam having a beam width in the first lateral direction as the electron scans the subpixels in a second lateral direction generally perpendicular to the first lateral direction, the beam width in the first lateral direction being substantially at least twice the average subpixel width in the first lateral direction.

28. A structure as in Claim 27 wherein:

each subpixel comprises one of the transistors and the corresponding one of the liquid-crystal cells: and

the transistor have, in the first lateral direction, an average transistor width largely constituting the average subpixel width in the first lateral direction.

29. A structure as in Claim 1 wherein the specified light comprises visible light.

30. A structure as in Claim 29 wherein the visible light comprises color light.

31. A method of operating a light-modulating structure in which (a) a plurality of liquid-crystal cells overlie a substrate above where the substrate is substantially transmissive of specified light, (b) each of a like plurality of transistors respectively corresponding to the liquid-crystal cells is in (b1) a non-conductive condition in which its channel-region electric field is substantially insufficient for conduction or (b2) a conductive condition in which its channel-region electric field is sufficient for at least partial conduction, and (c) each transistor is in electrical communication with the corresponding liquid-crystal cell, the method being initiated with all the transistors in their non-conductive conditions, the method comprising:

sequentially bombarding selected ones of the transistors with electrons according to an image pattern at a dosage and average energy that cause each selected transistor to enter its conductive condition while all the transistors are disabled; and

subsequently enabling each selected transistor in a writing manner that results in the specified light having its polarization direction selectively rotated in the corresponding liquid-crystal cell where, when there are multiple selected transistors, all of the selected transistors are so enabled substantially simultaneously so as to result in the specified light having its polarization directions selectively rotated substantially simultaneously in all of the corresponding liquid-crystal cells.

32. A method as in Claim 31 further including subsequent to the enabling act:

substantially simultaneously bombarding all the transistors with electrons at a dosage and average energy that cause all the transistors to be in their conductive conditions while being enabled in an erasing manner that results in the polarization directions of the specified light in all the liquid-crystal cells being rotated substantially the same amount as little as zero; and

subsequently substantially simultaneously bombarding all the transistors with electrons at a dosage and average energy that cause all the transistors to enter their non-conductive conditions while all the transistors are disabled.

33. A method as in Claim 32 further including, subsequent to the enabling act and prior to the second-occurring bombarding act, bombarding each selected transistor with electrons at a dosage and average energy that cause that transistor to return to its non-conductive condition while all the transistors are disabled where, when there are multiple selected transistors, all of the selected transistors are so bombarded substantially simultaneously.

34. A method as in Claim 32 wherein the average energy of the electrons is higher for each of the first-occurring and second-occurring bombarding acts than for the third-occurring bombarding act.

35. A method as in Claim 29 wherein:

the light-modulating structure is allocated into an array of pixels, each comprising multiple subpixels, each subpixel comprising one of the transistors and the corresponding one of the liquid-crystal cells, the transistor having an average transistor width in a first lateral direction; and

the bombarding act comprises bombarding the transistors with electrons of a scanning electron beam whose beam width in the first lateral direction is, as the electron beam scans the transistors in a second lateral direction generally perpendicular to the first lateral direction, substantially at least twice the average transistor width in the first lateral direction.

36. A method as in Claim 35 wherein the electron beam provides electrons having a generally Gaussian spatial distribution in the first lateral direction, the beam width in the first lateral direction

being the Gaussian distribution width at which the current density of the electron beam is one half the maximum current density of the electron beam.

37. A method of operating a light-modulating structure in which (a) a plurality of liquid-crystal cells overlie a substrate above where the substrate is substantially transmissive of specified light, (b) each of a like plurality of transistors respectively corresponding to the liquid-crystal cells is in (b1) a non-conductive condition in which its channel-region electric field is substantially insufficient for conduction or (b2) a conductive condition in which its channel-region electric field is sufficient for at least partial conduction, and (c) each transistor comprises (c1) first and second laterally separated source/drain regions with the first source/drain region being in electrical communication with the liquid-crystal cell corresponding to that transistor, (c2) a semiconductor layer having semiconductor material that extends between the source/drain regions, and (c3) a gate element situated at least partially above the semiconductor material between the source/drain regions for controlling the conductive and non-conductive conditions of that transistor, the method being initiated with all the transistors in their non-conductive conditions, the method comprising:

sequentially bombarding the gate elements of selected ones of the transistors with electrons according to an image pattern at a dosage and average energy that cause each selected transistor to enter its conductive condition while the second source/drain regions of all the transistors are electrically subjected to transistor-disabling high impedance; and

subsequently providing the second source/drain regions of all the transistors with a low-impedance writing voltage that results in the specified light having its polarization direction selectively rotated in the liquid-crystal cell corresponding to each selected transistor where, when there are multiple selected transistors, the second source/drain regions of all the selected transistors receive the low-impedance writing voltage substantially simultaneously so as to result in the specified light having its polarization directions selectively rotated substantially simultaneously in all of the corresponding liquid-crystal cells.

38. A method as in Claim 37 further including subsequent to the providing act:

substantially simultaneously bombarding the gate elements of all the transistors with electrons at a dosage and average energy that cause all the transistors to be in their conductive conditions while the second source/drain regions of all the transistors are provided with a low-

impedance erase voltage that results in the polarization directions of the specified light in all the liquid-crystal cells being rotated substantially the same amount as little as zero; and

subsequently substantially simultaneously bombarding the gate elements of all the transistors with electrons at a dosage and average energy that cause all the transistors to enter their non-conductive conditions while the second source/drain regions of all the transistors are electrically subjected to transistor-disabling high impedance.

39. A method as in Claim 38 further including, subsequent to the providing act and prior to the second-occurring bombarding act, bombarding the gate element of each selected transistor with electrons at a dosage and average energy that cause that transistor to return to its non-conductive condition while the second source/drain regions of all the transistors are electrically subjected to transistor-disabling high impedance where, when there are multiple selected transistors, the gate elements of all the selected transistors are so bombarded substantially simultaneously.

40. A method as in Claim 38 wherein the average energy of the electrons is higher for each of the first-occurring and second-occurring bombarding acts than for the third-occurring bombarding act.

41. A method as in Claim 38 further including repeating the bombarding and providing acts with potentially a different image pattern wherein:

the erase voltage is at largely the same erase value during both bombarding acts in which the erase voltage is provided;

the writing voltage is a largely one writing value during one of the providing acts and at largely another writing value during the other of the providing acts; and

the erase value lies approximately midway between the two writing values.

42. A method as in Claim 37 wherein each liquid-crystal cell operates from (i) a low-rotation condition in which the polarization direction of the specified light in that cell rotates a first amount as little as zero to (ii) a high-rotation condition in which the polarization direction of the specified light in that cell rotates a second amount greater than the first amount.

43. A method as in Claim 37 wherein the second source/drain regions of all the transistors are electrically coupled together to a control component.

44. A method as in Claim 37 wherein the light-modulating structure further including a flexible membrane situated between each transistor and the corresponding liquid-crystal cell.

45. A method as in Claim 37 wherein the gate element of each transistor comprises:

a first gate dielectric layer situated over at least the semiconductor material between the source/drain regions; and

a second gate dielectric layer overlying the first gate dielectric layer, the second gate dielectric layer being capable of storing electrical charge and of having its electrical charge change upon being bombarded by electrons so as to selectively induce the channel-region electric field for the non-conductive or conductive condition of that transistor depending on the electron dose and average energy.

46. A method as in Claim 37 wherein the light-modulating structure further including a like plurality of display electrodes respectively corresponding to the liquid-crystal cells and thereby respectively corresponding to the transistors, each display electrode electrically coupled to the first source/drain region of the corresponding transistor and electrically contacting the corresponding liquid-crystal cell along largely all of its upper surface.

47. A method as in Claim 45 wherein each display electrode contacts the corresponding liquid-crystal cell along its upper surface, the specified light being reflected off each display electrode along where it meets the upper surface of the corresponding liquid-crystal cell.

48. A method as in Claim 47 wherein the light-modulating structure further includes:

an electron-beam system for bombarding the gate elements of the transistors with electrons; and

a control component for disabling the transistors and for providing the writing and erase voltages.

49. A method comprising:

fabricating a light-modulating structure in which (a) a plurality of liquid-crystal cells overlie a structure substrate above where the structure substrate is substantially transmissive of specified light and (b) each of a like plurality of transistors respectively corresponding to the liquid-crystal cells is in electrical communication with the corresponding liquid-crystal cell;

providing an electron-beam system for bombarding each transistor with electrons that cause it to be selectively in (i) a non-conductive condition in which its channel-region electric field is substantially insufficient for conduction or (ii) a conductive condition in which its channel-region electric field is sufficient for at least partial conduction; and

providing a control component which, during selected time periods when a transistor is in its conductive condition, provides that transistor with a control signal that results in the specified light having its polarization direction selectively rotated in the corresponding liquid-crystal cell.

50. A method as in Claim 49 wherein the fabricating act includes electrically coupling the transistors together for receiving their control signals as substantially a common control signal from the control component.

51. A method as in Claim 49 wherein the fabricating act includes furnishing the light-modulation structure with a flexible membrane situated between each transistor and the corresponding liquid-crystal cell.

52. A method as in Claim 49 wherein the fabricating act includes creating each transistor to comprise:

first and second laterally separated source/drain regions with the first source/drain region being in electrical communication with the liquid-crystal cell corresponding to that transistor;

a semiconductor layer having semiconductor material that extends between the source/drain regions; and

a gate element situated above at least the semiconductor material between the source/drain regions for controlling the conductive and non-conductive conditions of that transistor.

53. A method as in Claim 52 wherein an exposed surface of the gate element of each transistor has a secondary electron emission coefficient (a) less than 1 for electron bombardment at an average energy below a crossover value and (b) greater than for electron bombardment at an average energy above a crossover value in a range extending to a higher energy value.

54. A method as in Claim 52 wherein the creating acts comprises forming the gate element of each transistor to comprise:

a first gate dielectric layer situated over at least the semiconductor material between the source/drain regions; and

a second gate dielectric layer overlying the first gate dielectric layer, the second gate dielectric layer being capable of storing electrical charge and of having its electrical charge change upon being bombarded by electrons from the electron-beam system so as to selectively induce the channel-region electric field for the non-conductive or conductive condition of that transistor depending on the electron dose and average energy.

55. A method as in Claim 54 wherein the second gate dielectric layer of each transistor has a secondary electron emission coefficient (a) less than 1 for electron bombardment at an average energy below a crossover value and (b) greater than for electron bombardment at an average energy above a crossover value in a range extending to a higher energy value.

55. A method as in Claim 52 wherein the fabricating act includes furnishing the light-modulation structure with a like plurality of display electrodes respectively corresponding to the liquid-crystal cells and thereby respectively corresponding to the transistors such that each display electrode is electrically coupled to the first source/drain region of the corresponding transistor and electrically contacts the corresponding liquid-crystal cell along largely all of its upper surface.

57. A method as in Claim 56 wherein each display electrode is light reflective along where it contacts the upper surface of the corresponding liquid-crystal cell.

58. A method as in Claim 49 wherein the fabricating act includes:

forming, on a mandrel substrate, an intermediate structure having a like plurality of bottom-side depressions at respective locations for the liquid-crystal cells;

forming the transistors on the intermediate structure;

removing the mandrel substrate;

substantially removing any material in the bottom-side depressions;

substantially filling the bottom-side depressions with liquid-crystal material; and

providing the structure substrate below the depressions as substantially filled with the liquid-crystal cell material.